FINDING OF NO SIGNIFICANT IMPACT (FONSI)

RESEARCH ON WILDFIRE HAZARD REDUCTION IN PONDEROSA PINE ECOSYSTEMS AT GRAND CANYON NATIONAL PARK

The National Park Service proposes to conduct a research experiment project designed to test four management prescriptions on two small-scale (80-acre) experimental blocks. This research would enable the park to evaluate current fire management approaches and to compare them to two new fuels reduction approaches involving mechanical thinning of small-diameter trees followed by prescribed burning. Results of this research would be used to augment current fire management practices, and to guide future ponderosa pine ecosystem planning and management decisions.

In February 2002 the National Park Service (NPS) prepared a combined Environmental Assessment/Assessment of Effect (EA/AEF) for *Research on Wildfire Hazard Reduction in Ponderosa Pine Ecosystems at Grand Canyon National Park*. This EA/AEF, in accordance with the National Environmental Policy Act (NEPA), analyzed the impacts that would result from thinning and burning treatments on two 80-acre blocks, one each on the North and South Rims. Two action alternatives were evaluated in the EA/AEF, as well as impacts resulting from implementing the no-action alternative.

PREFERRED ALTERNATIVE

The project proposes to complete experimental treatments on a total of 160 acres, 80 acres of which are in a South Rim experimental block and 80 acres of which are in a North Rim experimental block. Both the North and South Rim 80-acre experimental blocks would be further divided into four 20-acre experimental units. The treatment prescriptions would be randomly assigned and are described below.

1) Intermediate Thinning and Burning Treatment (Intermediate Treatment). One 20-acre unit on both the North and South Rims (total of 40 acres) would undergo an intermediate treatment. Under this treatment, all trees less than 5 inches diameter at breast height (dbh, typically cited as 4.5 feet above ground level) would be cut, except those needed for replacement of lost presettlement trees. The thinning would be followed by prescribed fire treatments.

2) Minimal Thinning and Burning Treatment (Minimal Treatment). One 20-acre unit on both the North and South Rims (total of 40 acres) would undergo a minimal treatment. Under this treatment, thinning would be targeted around individual presettlement-age trees. Trees with a dbh of 5 inches or less, within a predetermined distance around all presettlement-age trees, would be cut. The maximum thinning distance is equal to the average height of the canopy within 40 feet surrounding the target tree, with a minimum of 40 feet. For example, if the average canopy height were 50 feet, thinning would extend out to 50 feet from the target tree. The thinning would be followed by prescribed fire treatments.

3) Burn-only Treatment. One 20-acre unit on both the North and South Rims (total of 40 acres) would undergo a burn-only treatment. No trees on these units would be cut

except when required to mitigate specific hazards to safe prescribed burning. The units would only be treated with prescribed fire.

4) Control. One 20-acre unit on both the North and South Rims (total of 40 acres) would serve as a control. Under this treatment no trees would be thinned, and fire would continue to be excluded from the unit.

MITIGATION MEASURES

The mitigation measures listed below are considered part of the preferred alternative and would be followed during project implementation. These actions were developed to lessen the potential for adverse impacts for implementing the preferred alternative, and have proven to be effective in reducing environmental impacts on previous projects.

- Smoke mitigation techniques include assuring proper fuel moisture and taking advantage of weather conditions that promote smoke dispersal. Broadcast or slash pile burning would be used to dispose of slash generated by the treatments in the action alternatives.
- In order to prevent the introduction and minimize the spread of exotic vegetation and noxious weeds, the following mitigation measures would be incorporated into the action alternatives:
  - pressure washing of project work vehicles before entering the Park;
  - parking vehicles on existing roads or parking lots;
  - any areas disturbed by vehicles would be revegetated using adapted native seed and/or plants; and
  - monitoring and follow-up treatment of exotic vegetation would occur for 2-3 years after project is completed.
- If previously unknown archaeological resources are discovered, all work would be halted until the resources could be identified and documented and an appropriate mitigation strategy developed in consultation with the State Historic Preservation Officer. If human remains were uncovered as a result of project implementation, all work in the area would cease until Native American Graves Protection and Repatriation Act requirements are met.
- Best management practices identified to protect soil resource and waters quality include:
  - Soil Productivity. To maintain or improve soil productivity, manage towards a minimum of 10 tons of slash material per acre in appropriate size classes where feasible (i.e. outside of visual corridors, fuel breaks, etc.). Slash material should be distributed between humus, litter, small woody (<3 inches in diameter), and large woody components (>3 inches in diameter) with at least 5-7 tons being the large woody components.
  - Soil Loss at Tolerance. In order to prevent soil loss from exceeding soil loss at tolerance, effective vegetative (litter and plants) ground cover must be maintained. Current soil rates are well within tolerance soil loss rates. Potential soil loss can exceed tolerable soil loss rates on slopes greater than 15% and impair soil productivity as effective vegetative ground cover decreases. The following effective vegetative ground cover (%), after harvest, is required as a minimum in order to prevent soil loss greater than tolerance levels: 0-15% slopes = 10% effective ground cover 16-40% slopes = 40% effective ground cover.
- For minimizing the potential for impacts to visitor use, mitigation measures would be implemented:
  - All stumps would be cut flat and as low to the ground as possible. Stumps would be left to decompose and/or be consumed by fire.

- Removable tree marking would be used wherever possible and most other marks would be small and inconspicuous. Where clear visual marks are needed to mark fire line, marks would be on the side of the tree not facing adjacent roads.
- Slash would be lopped into short length and then scattered or piled. Any remaining slash would be consumed by repeated burns in future years. Any undesirable visual effects would be covered by new vegetation within 1-2 years of burning.

- For minimizing the potential for impacts to proposed wilderness, trees on the North Rim experimental block would be thinned with hand tools only, in keeping with the "minimum tool concept" for wilderness.

ALTERNATIVES CONSIDERED

The EA/AEF evaluated three alternatives: a no-action alternative, the preferred alternative as described above, and another action plan, the study plan alternative.

- Under the no-action alternative, data would not be collected at Grand Canyon National Park on new methodologies for management of ponderosa pine ecosystems. Routine, planned land management practices would continue on the experimental blocks. The experimental blocks would continue to be managed in accordance with existing NPS policies and guidelines such as NPS Management Policies (2001), Grand Canyon National Park's 1995 General Management Plan, and 1992 Fire Management Plan. The consequences of fire exclusion and/or suppression include catastrophic losses of large tracts of forest to fire, disease, and drought. The forest communities on the North and South Rim experimental blocks would continue to be managed under the Park's Fire Management Plan. To that end, the experimental blocks would be managed under a policy of wildland fire use, where naturally occurring fires would be monitored and allowed to burn if conditions were within prescribed limits. Hazardous fuel loads and the potential for stand replacement fires would continue to exist on the untreated units, especially on the denser North Rim unit.

- Under Alternative "B", each of two 80-acre project blocks on the North and South Rims would be divided into four 20-acre units. Each of the four units would undergo one of three levels of treatment or serve as the control. The treatments include: 1) a full restoration treatment that includes mechanical thinning to emulate presettlement forest structure, followed by prescribed burning; 2) a minimal thinning treatment to reduce fire hazard, followed by prescribed burning; 3) a prescribed fire only treatment; and 4) a control.

The preferred alternative differs from the Alternative "B" on the following points:

1. A 5-inch limit would be placed on trees to be thinned. A small diameter limit would: enable all thinned material to be left on site as slash, be applicable to roadless areas, eliminate need for skid trails or landings, be more feasible with hand tools, and accomplish research objectives.
2. No wood would be utilized for any purpose or removed from the experimental sites. The thinned trees would be broadcast burned or burned in piles. Grand Canyon National Park fire staff would make a determination of what technique would be used to safely burn this slash.
3. Two years after burning, the effectiveness of the 5-inch limit and other aspects of the treatments would be assessed.
4. No mechanized equipment would be used for thinning on the North Rim site, proposed for wilderness status.

5. No road improvements, skid trails, or landings would be needed or constructed.
6. Litter and duff would be raked away from presettlement trees in the two thinning treatments, but not in the burn-only treatment. This would allow the burn-only treatment to serve as a better comparison to current management practice.

The preferred alternative was selected over the other two alternatives because it would allow Grand Canyon National Park to research treatment alternatives of wildfire hazard reduction while also addressing public input about forest thinning. While both action alternatives meet the purpose and need for action, the preferred alternative better addresses the potential for soil disturbance in the project area and more adequately addresses wilderness and roadless area concerns.

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The Council on Environmental Quality (CEQ) provides direction that the "environmentally preferable alternative is the alternative that will promote the national environmental policy" as expressed in NEPA's Section 101:

1. fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings;
3. attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
4. preserve important historic, cultural and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
5. achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and
6. enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

This is the agency preferred alternative, and would protect the Park's resources by providing scientifically based management alternatives, by protecting old ponderosa pine forests for succeeding generations. Grand Canyon's ponderosa pine forests are at risk of severe and dangerous fire. The agency preferred alternative would enable comparisons of two current and two new management strategies. Information gained would be used to: 1) reduce fire risks and preserve safe, healthy, and aesthetically and culturally pleasing surroundings for the long-term; 2) reverse the unintended and undesirable consequences of fire exclusion and begin to restore the structure and functions of the ponderosa community including its biotic and abiotic components; 3) work to develop a better means to preserve historic, cultural, and natural aspects of Grand Canyon's ponderosa pine forests in a manner that would enable current and future generations of visitors a variety of appropriate uses; and 4) provide the benefits offered by wildlands in the Park by managing forests in a sustainable manner.

Although the preferred alternative would not achieve ecological objectives as quickly or thoroughly as Alternative "B", it would enable development of new forest management strategies in an adaptive and incremental manner (treatments are limited to site specific and small scale applications such as at wildland urban interfaces, burn unit perimeters, sensitive cultural and natural resources, and agency boundary). Therefore, the agency-preferred alternative is the environmentally preferable alternative.

WHY THE PREFERRED ALTERNATIVE WILL NOT HAVE A NOTICEABLE EFFECT ON THE HUMAN ENVIRONMENT

As defined in 40 CFR §1508.27, significance is determined by examining the following criteria:

Impacts that may be both beneficial and adverse. The preferred alternative will not affect geology, prime and unique farmlands, environmental justice, tourism, or minorities or low-income populations or communities.

The preferred alternative would result in a short-term moderate impact to air quality due to increased smoke production from prescribed fires and increased vehicle traffic during implementation of this alternative. Mitigation measures associated with this alternative should minimize the impacts to air quality. The preferred alternative would have negligible long-term impacts on air quality.

The preferred alternative would result in short-term negligible impacts, to moderate adverse impacts to biotic communities due to the cutting of trees less than 5 inches dbh, followed by prescribed burning. Some species dependent on dense forest conditions would lose 120 acres of potential habitat. Other species dependent on open forest conditions would benefit from an increase in 120 acres of potential habitat. The preferred alternative could result in a short-term negative impact from exotic vegetation due to the potential spread of non-native species on to the site after thinning and burning are complete. Mitigation measures associated with this alternative should be sufficient to prevent non-native vegetation from becoming a long-term impact to the site or surrounding lands.

The preferred alternative would result in short-term negligible to minor adverse impacts to soil and water resources due to the reduction in overstory and the disturbance associated with treatment activities. Mitigation measures to protect long-term soil productivity and water resources associated with this alternative should be sufficient to prevent any long-term impact to soil and water resources.

Implementation of the preferred alternative would result in no historic properties affected. A previously identified archeological site lies inside the control unit on the Grandview experimental block. This study site would not be disturbed under the preferred alternative. No cultural sites are located on the North Rim experimental block. Mitigation measures associated with this alternative are expected to minimize the potential for impacts to unknown cultural resources.

The preferred alternative would result in a short-term minor benefit to fire management as fuel loads would be reduced on 120 acres. The preferred alternative would have long-term benefits on fire management by providing science-based information to guide future fire management planning.

The preferred alternative would result in negligible to minor effect on Park operations by increasing vehicle use on roads used to access the units during project implementation, resulting in the need for additional road maintenance.

The preferred alternative would result in negligible to minor effect on socioeconomic resources; it would be beneficial to the local economy by employing local contractors for a few months to cut trees.

The preferred alternative would result in short-term minor adverse impacts to visitor use resources. Visual resources would be impacted by the implementation of this alternative. Mitigation measures associated with this alternative should minimize these impacts. The preferred alternative would have negligible long-term impacts on visitor use resources.

The preferred alternative would have negligible short- and long-term impacts on wilderness resources. The increased activity associated with completing the treatments would impact wilderness values. However, these impacts would be extremely short-term in nature and limited to the small spatial area of 80 acres. In addition, short-term impacts would occur from dust and smoke in the proposed wilderness area that could potentially affect opportunities for solitude. The study areas have been intentionally located next to publicly accessible roads in order to minimize ground disturbance.

Degree of effect on public health or safety. The preferred alternative would have no effect on public health and safety because there would be only negligible to minor short-term effects due to prescribed burning. There would be long-term indirect beneficial effects due to development and testing of new prescriptions for treating hazardous forest fuels.

Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas. As described in the environmental assessment, prime farmlands and wetlands will not be affected. No wild and scenic rivers are near the project sites and none will be affected by the preferred alternative. The preferred alternative would have long-term indirect beneficial effects to ecologically critical park lands by developing and testing better ways to protect old ponderosa pine forests from damaging effects of high intensity fire. See below for effects on historic and cultural resources and for effects on ecological critical areas.

Degree to which effects on the quality of the human environment are likely to be highly controversial. The preferred alternative would have minor to moderate short–term visual effects on 120 acres of the human environment, and would have minor to moderate long-term beneficial effects by developing and testing better ways to protect old ponderosa pine forests from damaging effects of high intensity fire.

Degree to which the possible effects on the quality of the human environment are highly uncertain or involve unique or unknown risks. There were no highly uncertain, unique or unknown risks identified in the environmental assessment or the public review period. Effects would be documented through research and long-term monitoring.

Whether the action may establish a precedent for future actions with some degree of effect or represents a decision in principle about a future consideration. The preferred alternative neither establishes a precedent for future actions with some degree of effect nor represents a decision in principle about a future consideration.

Whether the action is related to other actions with individually negligible but cumulatively measurable impacts. Impacts of the preferred alternative identified in the EA were air quality, biotic communities, soil and water, historic resources, park operations,

socioeconomic resources, visitor experience and wilderness. As described in the EA, a variety of past, present, and reasonably foreseeable future actions have or may affect resources. However, the adverse impacts of the preferred alternative would be a relatively minor component of the overall minor cumulative impact, due to the limited area of the preferred alternative.

Degree to which the action may adversely affect districts, sites, highways, structures, or objects listed on National Register of Historic Places or may cause loss or destruction of scientific, cultural, or historical resources. The project areas were surveyed intensively for archeological and cultural resources. No historic properties listed or eligible for listing on the National Register of Historic Places occur within the Area of Potential Effect. The State Historic Preservation Office has concurred with these findings (James Garrison; May 20, 2002).

***Degree to which the action may adversely affect an endangered or threatened species or its critical habitat*.. ** The Mexican spotted owl (MSO; *Strix occidentalis lucida*) is a federally listed threatened species. Critical habitat has recently been designated for the MSO (Federal Register 2/01/01). The North Rim experimental block lies within the area designated as critical habitat and contains the primary constituent elements required to qualify as critical habitat. The Grandview experimental block lies outside the critical habitat boundary. The North Rim block meets the definition of Restricted Habitat as defined in the MSO Recovery Plan. According to the Recovery Plan "Management priority should be placed on reducing identified risks to spotted owl habitat. The primary existing threat is destructive wildfire. Thus, we strongly encourage the use of prescribed and prescribed natural fire to reduce hazardous fuel accumulations. Thinning from below may be desirable or necessary before burning to reduce ladder fuels and the risk of crown fire. Such thinning must emphasize irregular tree spacing." The preferred alternative is consistent with these recommendations.

In 1991, approximately 6,000 acres of potential North Rim habitat east of the treatment area was surveyed, but no responses were recorded. Surveys were conducted on the North Rim experimental block and surrounding area in spring and summer of 1998 and 1999 using the approved protocol (USDA US Forest Service 1991); no MSO responses were elicited (USGS, Biological Resources Division 2001). In 1994 and 1995, the South Rim treatment area and the surrounding Forest Service and GRCA land were surveyed for spotted owls with negative results. Surveys were conducted on both blocks in the 2001 season with negative results. A single response was detected by MSO survey crews at the Grandview site on April 4, 2002, but subsequent surveys have not detected any continued presence. Additional surveys will be completed in 2002 prior to implementation of thinning or burning operations.

The preferred alternative would have minor to moderate short-term impacts, and negligible long-term impacts on the Mexican spotted owl. In the unlikely event that nesting owls are located, the area would be considered Protected Habitat. In an Informal Consult, the U.S. Fish and Wildlife Service (David Harlow, June 17, 2002) concurred with the findings in the Biological Assessment (may affect – not likely to affect) with respect to the Mexican Spotted Owl, contingent on Grandview Experimental Block prescribed fire and treatment activities being conducted outside of breeding season (March 1-Aug 31st) and not before September 15, 2002.
At the request of the Arizona Game and Fish Department (AGFD), a meeting was convened (June 25th, 2002) to discuss the nature of their support for the project. Their concerns in minimal and intermediate treatments were:
1) the potential for spread of *Armillaria mellea*;

2) and thinning of pinyon pine, juniper, aspen, and gambel oak.

Regarding their first concern, it was the opinion of Rocky Mountain Experiment Station's expert forest pathologist Mary Lou Fairweather, that the treatments we were proposing were in the short-term a positive treatment, and in the long-term would serve to improve old tree vigor through diminishing competitive stress, with little chance of spreading *Armillaria mellea*. Regarding their second concern, we have incorporated in the Scope of Work their request to not thin pinyon pine, juniper, and aspen species; and to designate them as leave trees. With regard to the treatment of Gambel oaks;

a) the Revised Work Plan specifies that prescribed fire will precede any thinning of Gambel oaks, and thinning would only occur after the opportunity to view and assess the results of the prescribed fire;
b) all old trees of any species will receive protective measures (in the case of old Gambel oak clusters, this would include raking of leaf litter and removing coarse woody debris from cluster centers) prior to the prescribed fire portion of proposed treatments.

These measures were deemed satisfactory by AGFD, and AGFD fully supports this research project.

Whether the action threatens a violation of Federal, state, or local environmental protection law. The preferred alternative violates no federal, state, or local environmental protection laws.

IMPAIRMENT OF PARK RESOURCES OR VALUES

In addition to determining the environmental consequences of the three alternatives, NPS policy (USDI National Park Service 2001) requires analysis of potential effects to determine whether or not actions would impair park resources. The fundamental purpose of the national park system, established in the Organic Act and reaffirmed by the General Authorities Act, as amended begins with a mandate to preserve park resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. Congress has given the NPS management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of the park. However, this discretion is limited by the statutory requirement that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. An impact to any park resource or value may constitute impairment. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is: 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; 2) key to the natural or cultural integrity of the park or to the opportunities for enjoyment of the park; or 3) identified as a goal in the park's general management plan or other relevant NPS planning document. Impairment may result from NPS activities in managing the park, visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the park.

Because there would be no major adverse impacts to a resource or value whose conservation is: 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Grand Canyon National Park; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents, there would be no impairment of the Grand Canyon National Park's resource or values.

PUBLIC INVOLVEMENT

A draft EA titled *Grand Canyon Forest Restoration Research* was submitted for public review in January 1999. Based on an evaluation of the comments received about the draft EA, Park staff developed a new preferred alternative. To reflect the reduced scope and application, this revised EA/AEF has been re-titled *Research on Wildfire Hazard Reduction in Ponderosa Pine Ecosystems at Grand Canyon National Park*, and was made available for public review and comment during a 45-day period ending June 5, 2002. Over 700 informational packets were mailed to past participating and currently interested private and public individuals. Open house public meetings were announced in local and regional media, and held in Flagstaff AZ, Grand Canyon AZ, and Kanab UT. Twenty-nine letters were received on wildfire hazard reduction research. All could be accurately characterized from neutral to slightly positive/supporting to fully supporting. Some of the characteristic excerpts follow:

1) …we support this…project, as it is unlikely to affect prehistoric cultural resources (Hopi Tribe)
2) …seems adequate, and covers a variety of treatments…(individual respondent)
3) …would like thinning treatment 'timber' for home construction, why can't locals and tribes have access (individual respondent, Valle AZ)
4) …it's unfortunate that the Park Service has chosen to add constraints to its research…limits are arbitrary, leaves the wood onsite, and does not allow beneficial use of the thinned materials (Five Counties Association of Governments – St. George UT)
5) …wants to see it implemented (Forest Conservation Council)
6) …we strongly support the Preferred Alternative (New Mexico Audubon Society)
7) …much in favor of, begin immediately! (individual respondent)
8) …very well designed rollout and skillfully presented complex message conveying the true nature of the experiment (individual respondent)
9) …your task is a complex one…don't take too long to analyze the data…there is much precious resource at high risk…(Mohave County Public Land Use Committee)
10) …after 60 years experience in natural resource management, …I believe your Alternative C is excellent and very much needed for wise resource management, good luck (individual respondent)

Letters from the Navajo Nation and the Hopi Tribe, indicated no concerns or objections with the undertakings and the proposed locations of the project sites.
A letter from the State Historic Preservation Office (Anne Howard, May 17, 2002) concurred with the findings in the EA/AEF with respect to cultural resources.
Letters from the US Fish and Wildlife Service (David Harlow, June 17, 2002) and the Arizona Game and Fish Department (John Kennedy, June 6, 2002) were supportive, with contingencies addressed in section above (Degree to which the action may adversely affect an endangered or threatened species or critical habitat).

CONCLUSION

The preferred alternative does not constitute a major federal action, which normally requires preparation of an environmental impact statement (EIS). The preferred alternative will not have a noticeable effect on the human environment. Negative environmental impacts that could occur are minor to moderate and temporary in effect. There are no unmitigated adverse impacts on public health, public safety, threatened or endangered species, sites or districts listed in or eligible for listing in the National Register of Historic Places, known

ethnographic resources, or other unique characteristics of the region. No highly uncertain or controversial impacts, major cumulative impacts, unique or unknown risks, or elements of precedence were identified. Implementation of the action will not violate any federal, state, or local environmental protection law.

Based on the foregoing, it has been determined that an EIS is not required for this project and thus will not be prepared.

Recommended: _____ 7/26/02
Jeffrey Cross — Date
Science Center Director, Grand Canyon National Park

Recommended: _____ 7/26/02
for Joseph F. Alston — Date
Superintendent, Grand Canyon National Park

Approved: _____ 8/01/02
Karen P. Wade — Date
Intermountain Regional Director